



Docket No.: C1134.70003US00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Francis J. DiSalvo et al.
Serial No.: 10/630237
Confirmation No.: 8278
Filed: July 29, 2003
For: INTERMETALLIC COMPOUNDS FOR USE AS CATALYSTS AND
CATALYTIC SYSTEMS
Examiner: B. Lewis
Art Unit: 1745

Certificate of Mailing Under 37 CFR 1.8(a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as First Class Mail, in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: October 4, 2006

Michael Chusar
Signature

DECLARATION OF HÉCTOR D. ABRUÑA

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Héctor D. Abruña, state the following:

1. I am the Émile M. Chamot Professor and Chair in the Department of Chemistry and Chemical Biology at Cornell University. I have been at Cornell University for the past 23 years. My research includes investigating the catalytic properties of ordered intermetallic compounds. I received B.S. and M.S. degrees from Rensselaer Polytechnic Institute in 1975 and 1976, respectively and a Ph.D. from the University of North Carolina in Chapel Hill in 1980.

2. I am a co-inventor of the above-referenced patent application. I have a financial interest in the issuance of this application as a patent. A portion of any royalties derived from licensing of the intellectual property represented by this application will flow to me. I have reviewed the above-referenced patent application and the Office Action of April 4, 2006.

3. This declaration is being provided to describe some of the unexpected properties of certain embodiments of the invention described in this patent application. One aspect of the invention is that ordered intermetallic PtPb exhibits exceptionally good catalytic properties for oxidizing certain fuels including formic acid, methanol, ethanol and ethylene glycol. Example 2 in the patent application describes these exceptional properties of ordered intermetallic PtPb in comparison to Pt (a high performing conventional catalytic material).

As shown in Example 2, when oxidizing formic acid, an ordered intermetallic PtPb electrode exhibited an onset of oxidation potential of about 300 mV less positive than that of a pure Pt electrode, and a current density of about 40 times greater than that of a pure Pt electrode.

As shown in Example 2, when oxidizing methanol, an ordered intermetallic PtPb electrode showed an onset of oxidation potential of about 100 mV less positive than that of a pure Pt electrode and a current density of about 40 times greater than that of a pure Pt electrode.

As shown in Example 2, when oxidizing ethanol, an ordered intermetallic PtPb electrode showed an onset of oxidation potential of about 240 mV less positive than that of a pure Pt electrode and a current density of about 20 times greater than that of a pure Pt electrode.

As shown in Example 2, when oxidizing ethylene glycol, an ordered intermetallic PtPb electrode showed an onset of oxidation potential of about 110 mV less positive than that of a pure Pt electrode and a current density of about 6 times greater than that of a pure Pt electrode.

4. The catalytic activity of ordered intermetallic PtPb for the oxidation of formic acid, methanol, ethanol and ethylene glycol is exceptionally high and entirely unexpected. These properties lead to ordered intermetallic PtPb having significant advantages over conventional catalytic materials with respect to these fuels.

5. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Respectfully submitted,

Date: October 3, 2006

A handwritten signature in black ink, appearing to read 'Hector D. Abruña', written in a cursive style.

Héctor D. Abruña